

COMPLETE SOFTWARE DEVELOPMENT SUPPORT FOR THE MCS®-96 FAMILY OF MICROCONTROLLERS

Intel supports application development for the MCS®-96 family of microcontrollers with a complete set of development languages and utilities. These tools include a macro assembler, C compiler, PL/M compiler, linker/relocator program, floating point arithmetic library, a librarian utility, and an object-to-hex utility. Develop code in the language(s) you desire, then combine object modules from different languages into a single, fast program.

FEATURES

- Software tools support all members of Intel's MCS®-96 family
- ASM-96 macro assembler for speed critical code
- iC-96 package for structured C language programming, closely conforming to ANSI standards with many hardware specific extensions
- PL/M-96 package for the maintainability and reliability of a high-level language with support for many low-level hardware functions
- Linker/Relocator program for linking modules generated in assembler, PL/M or C and assigning absolute addresses to relocatable code. RL-96 prepares your code for execution in target with a simple, one-step operation
- 32-bit Floating Point Arithmetic Library to reduce your development effort and to allow fast, highly optimized numerics-intensive processing
- Library utility for creating and maintaining software object module libraries
- PROM building utility that converts object modules into standard hexadecimal format for easy download into various PROM Programmers
- Hosted on IBM PC XT/AT with PC-DOS 3.0 or above



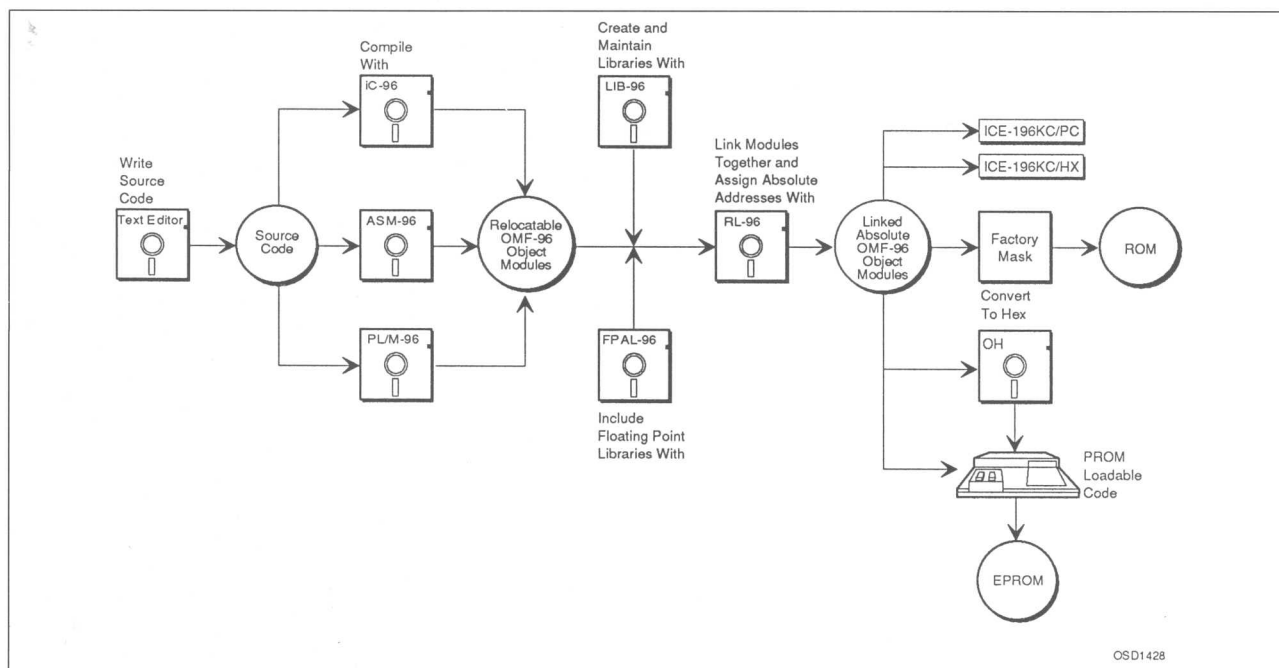


Figure 1. MCS[®] -96 Application Development Process

ASM-96 Macro Assembler

ASM-96 is the macro assembler for the MCS-96 family of microcontrollers, including the 80C196. ASM-96 translates symbolic assembly language mnemonics into relocatable object code.

The macro facility in ASM-96 saves development and maintenance time, since common code sequences need only be developed once. The assembler also supports symbolic access to the many features of the MCS-96 microcontrollers and provides an "include" file with all MCS-96 registers defined.

PL/M-96 Software Package

PL/M-96 is a high-level programming language designed to support the software requirements of advanced 16-bit microcontrollers. The PL/M-96 compiler translates PL/M high-level language statements into 8096 relocatable object code. Major features of the PL/M-96 compiler include:

- **Structured programming.** The PL/M language supports modular and structured programming, making programs easier to understand, maintain, and debug.

- **Built-in functions.** PL/M-96 includes an extensive list of functions, including TYPE CONVERSION functions, STRING manipulations, and functions for interrogating MCS-96 hardware flags.
- **Interrupt handling.** The INTERRUPT attribute allows you to define interrupt handling procedures. The compiler generates code to save and restore the program status word for INTERRUPT procedures.
- **Compiler controls.** Compile-time options increase the flexibility of the PL/M-96 compiler. These controls include: optimization, conditional compilation, the inclusion of common PL/M source files from disk, cross-reference of symbols, and optional assembly language code in the listing file.
- **Data types.** PL/M-96 supports seven data types, allowing PL/M-96 to perform three different kinds of arithmetic: signed, unsigned, and floating point.
- **Language compatibility.** PL/M-96 object modules are compatible with all other object modules generated by Intel MCS-96 translators.

iC-96 Software Package

Intel's iC-96 is a structured programming language designed to support applications for the 16-bit family of MCS-96 microcontrollers. Major features of the iC-96 compiler include:

- **Standard language.** iC-96 closely conforms to ANSI C standards. iC-96 code is linkable (via RL-96) with both PL/M-96 and ASM-96 modules via an "ALIEN" attribute. This allows programmers to utilize the optimal language for any application.
- **Architecture Support.** iC-96 generates code which is optimized for the MCS-96 architecture. iC-96 provides an INTERRUPT attribute, which allows you to define interrupt handlers in C. Library routines allow you to enable and disable interrupts directly from C. A REENTRANT/NOREENTRANT control included in iC-96 allows the compiler to identify procedures appropriately, thus making efficient use of the large MCS-96 register set.
- **In-Line Assembly.** With the in-line assembly feature of iC-96 you can embed assembly language instructions within your C code for added programming power and flexibility.
- **Symbolics.** The iC-96 compiler boosts programmer productivity by providing extensive debug information, including symbols. Debug information can be used to debug application code using the VLSiCE-96™ emulator for the 8x9x components or the ICE™-196 Kx PC/HX emulators for the 8xC19x components.

Run-Time Library Linker/Relocator

Intel's RL-96 utility is used to link multiple MCS-96 object modules into a single program and then assign absolute addresses to all relocatable addresses in the new program. Object modules can be of sources written in ASM-96, PL/M-96, or iC-96.

The RL-96 utility also promotes programmer productivity by encouraging modular programming. Because applications can be broken into separate modules, they're easier to design, test and maintain. Standard modules can be reused in different applications, saving software development time.

FPAL-96 Floating Point Arithmetic Library

FPAL-96 is a library of single-precision 32-bit floating point arithmetic functions. It adheres to the IEEE floating point standard for accuracy and reliability.

LIB-96

The Intel LIB-96 utility creates and maintains libraries of software object modules. Standard modules can be placed in a library and linked into application programs using RL-96.

OH

The OH utility converts Intel OMF-96 object modules into standard hexadecimal format. This allows the code to be loaded directly into a PROM via various PROM programmers.

Worldwide Service, Support, and Training

To augment its development tools, Intel offers a full array of seminars, classes, workshops, field application engineering expertise, hotline technical support, and on-site service.

Intel also offers a Software Support Contract which includes technical software information, automatic distributions of software and documentation updates, *iCOMMENTS* publication, remote diagnostic software, and a development tools troubleshooting guide.

Intel's standard 90-day Hardware Support package includes technical hardware information, telephone support, warranty on parts, labor, material, and on-site hardware support.

Intel Development Tools also offers a 30-day, money-back guarantee to customers who are not satisfied after purchasing any Intel development tool.

ORDERING INFORMATION

D86ASM96NL* 96 Assembler for PC XT or AT system (or compatible), running DOS 3.0 or higher

D86PLM96NL* PL/M-96 Software Package for PC XT or AT system (or compatible), running DOS 3.0 or higher

D86C96NL* iC-96 Software Package for PC XT or AT system (or compatible), running DOS 3.0 or higher

*Also Includes: Relocator/Linker, Object-to-hex converter, Floating Point Arithmetic Library, and Librarian.